

color and surfaces of the leaves, and size and form of the fruits. Some of the new species are separable in the seedling stage when three or four leaves have been formed, the rosette presenting a characteristic picture. De Vries suggests that the mutants or species derived by mutations in his experiments are quite as clearly separable as the species recognized in the currently accepted classifications of the oaks, hieraciums, or cochlearias.

(To be continued.)

OUR YELLOW LADY'S-SLIPPERS

BY P. A. RYDBERG

Some time ago I received a letter from Mr. Oakes Ames, of North Easton, Mass., which contained, among other matters, the following lines: "While looking over your revision of the Orchidaceae in Dr. Britton's 'Flora of the Northern States and Canada' (1901), I noticed that your key for the genus *Cypripedium* gives as a characteristic of *C. pubescens* (*hirsutum*) a pale yellow lip, flattened vertically, and as a characteristic of *Cypripedium parviflorum*, a bright yellow lip, flattened laterally. Have you found in working up your material that the case is reversed after all, and that Hooker, Gray and others were confused in their ideas?"

Although I revised the manuscript of the Orchidaceae for Dr. Britton's Manual, I did not find anything in the treatment of *Cypripedium* that I thought needed a change, but left that genus practically as Dr. Britton had it in the "Illustrated Flora." I added in this case the differences in the flattening of the lip, which character had been used here at the Garden. My understanding of the two species was, however, the same as that of Dr. Britton and I had no idea that Hooker, Gray or others had any other understanding. I thought, therefore, that the difference between the characteristics given by them and by us was more apparent than real and that it depended upon a different interpretation of terms. I, therefore, wrote to Mr. Ames, explaining my use of the words "vertically" and "laterally" flattened. By *vertically flattened*, I mean such a flattening as would be produced by a pressure from *above* and *below*, the

greatest expansion, therefore, being lateral, and by a *lateral* flattening I mean such a flattening as would be produced by a *lateral* pressure, the greatest expansion being vertical. I also remarked that one of the most prominent of the American botanists now living understands by these terms exactly the reverse.

From another letter from Mr. Ames I find that he has interpreted the terms in the meaning in which Dr. Britton and I used them. A little closer study of Hooker's and Gray's descriptions made me see that Mr. Ames was correct in claiming that they understood the two species differently from us. Where is the trouble? As the results of my attempts to answer this question may be of general interest, I give them to the readers of *TORREYA*, hoping that they will kindly help in throwing light upon certain unknown facts concerning the yellow lady's-slippers.

The large yellow lady's-slipper, *Cypripedium hirsutum* of the Illustrated Flora and Britton's Manual, I have seen twice in the living state, once many years ago in Michigan and once in New York. As I know it, the lip is low and broad, *i. e.*, flattened vertically. *Cypripedium pubescens* was described by Willdenow in his *Species Plantarum*, 4: 143. 1805. He afterward published an excellent figure in his *Hortus Berolinensis*, 1: *pl.* 13. This figure shows the low and broad lip, and shows that it is the same as the plant described in Britton's Manual as *Cypripedium hirsutum* Mill. Miller has no plate, but there is no doubt in my mind that his *Cypripedium hirsutum* is the same as Willdenow's *C. pubescens*. Of the latter there is also a fine illustration in Barton's Flora, 3: *pl.* 74. This also shows the broad lip. The figure published in Sweet's English Flower Garden, *pl.* 71, does not belong to this species, but to what I have regarded as *Cypripedium parviflorum*.

The specimens of *C. hirsutum* or *C. pubescens* in our herbaria apparently all have a broad lip, so far as one can judge from pressed specimens.

The small yellow lady's-slipper I have not seen in the living state in the east; but the plant that has gone under that name in the Black Hills of South Dakota and in the Rocky Mountains is well known to me. In this the lip is taller and narrower, *i. e.*,

somewhat compressed laterally. In all eastern specimens with small flowers in our herbaria, except one from Wisconsin, the lip seems to be like those from the Rocky Mountain region. The first plate I turned to of *C. parviflorum* was that in Curtis's Botanical Magazine, 23: *pl. 911*. This has the narrow high lip characteristic of the plant that I have held as *C. parviflorum* and which was published under that name in Britton's Manual. Turning to the Kew Index, I find that this plate is referred by Mr. Jackson to *C. pubescens*. It is evidently the same as *C. pubescens* of Sweet's English Flower Garden, mentioned above, but surely not the same as that of Willdenow's Hortus Berolinensis, which must be regarded as authentic. The same plant is also figured in Redouté's Les Liliacées, 1: *pl. 20*. 1802, under the name of *C. flavescens*.

So far my interpretations seemed to have been correct, but now comes the trouble. I turned to the original publication of *C. parviflorum* Salisb. in the Transactions of the Linnean Society, 1: 77. Salisbury has there a figure of the flower with a very broad and low lip, closely resembling Willdenow's figure of *C. pubescens*. *C. parviflorum* is compared with *C. Calceolus* of Europe and described and figured as having much smaller flowers than that species. It may be remarked that *C. Calceolus* scarcely has as large flowers as our *C. pubescens* and consequently the true *C. parviflorum* should not have larger flowers than *C. passerinum* of the far north and much smaller flowers than either of the two yellow lady's-slippers known by me.

The result of my investigations are in short as follows:

1. That *C. hirsutum* Mill. (*C. pubescens* Willd.) has been rightly understood by Dr. Britton and me, and wrongly so by the English botanists and by Gray.

2. That either do we have three species of yellow lady's-slippers, one large and one small-flowered, both with vertically flattened lip, and a third medium-sized one with laterally flattened lip; or else was *C. parviflorum* Salisb. a small-flowered form of *C. hirsutum*.

3. In either case, the one with laterally flattened lip is neither *C. pubescens* nor *C. parviflorum*.

4. If there are three species their names and synonyms would be as follows :

C. HIRSUTUM Mill. Gard. Dict. ed. 8. no. 3. 1768 (also of Britton's Manual); *C. pubescens* Willd. Sp. Pl. 4: 143. 1805; Hortus Berolinensis, 1: pl. 13; Barton's Flora, 3: pl. 74.

C. FLAVESCENS Redouté, Lil. 1: pl. 20. 1802; *C. parviflorum* Sims, Bot. Mag. 23: 911. 1806 (also of Britton's Manual); *C. pubescens* Sweet, Engl. Flower Garden, 1: pl. 71. 1823 (also of Gray's Manual).

C. PARVIFLORUM Salisb. Trans. Linn. Soc. 1: 77. pl. 2. f. 2. 1791 (probably also of Gray's Manual).

As I have never seen the small yellow lady's-slipper of the east in the living state and do not know the form of its lip I ask the readers of TORREYA kindly to communicate to me any facts they may have and to watch our cypripediums during the coming seasons that the difficulty may be cleared. I would also be very thankful if I could get fresh material (especially flowers) of either of the species.

N. Y. BOTANICAL GARDEN.

THE BRACKET FUNGI

BY L. M. UNDERWOOD

At every season of the year numerous tough, woody, or leathery fungi will be found shelving out from stumps, fallen logs, tree trunks, or railroad ties. Most of these are plants belonging to the Agaricales and may represent any one of four families according as they bear on their under side lamellae, pores, spines, or merely smooth surfaces. Essentially they are formed alike, with the spore-bearing surfaces looking downward and with a roof or pileus formed of interlacing mycelium more or less compacted and sometimes hardened into a thick crust. One of the commonest in late spring or early summer is *Favolus*, with pores angular like honeycomb, a small round or reniform plant more commonly growing from hickory limbs though often on other species of wood. This is the only species of its genus